AGRICULTURAL NEWS LETTER

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This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

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THE AGRICULTURAL NEWS LETTER serves as a medium of reporting new developments and new ideas in the field of agriculture, particularly as they are related to advancements through research. Material appearing herein may be reprinted in whole or in part, in the interest of advancing the general knowledge of new agricultural practices.

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WHAT FARM EDITORS ARE SAYING --

"America is living in a world revolution, but within America the change is evolutionary, not revolutionary. That is as it should be." -- Herschel Newsom in NATIONAL GRANGE MONTHLY

"We are getting tired of this routine but the experts say that by 1970 we will have a fifth plate to fill in this country. We hope they are right, and we could fill that fifth plate right now if we could cut the bugs out of their share." -- CALIFORNIA FARMER

"More power to the people who are trying to improve our farm programs! There will always be need for remodeling. Programs are the product of many years of hard thinking and hard experience. No party or farm organization has a monopoly." -- Paul Johnson in PRAIRIE FARMER

"Most every industrial institution has made some one person responsible for maintaining safe premises, equipment, and work practices. Industrial accidents, as a result, have been greatly reduced, whereas farming continues to be one of the most hazardous of all occupations; and increasingly so because of the growing use of power equipment." -- THE FARMER

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"The farm family has become a major customer of industry. Agriculture has become a dynamic force in the American economy. If this generation has learned one economic lesson it is this: Empty pocketbooks on the farm do not turn the wheels of industry in our cities." -- Dr. Paul Saunders in THE SOUTHERN PLANTER

"We do not presume to disagree with the noted scientists about the relationship between atomic tests and tornadoes, but we can't help wondering how they can be so sure their scientific studies are sound when this atomic fission business is so new." -- INDIANA FARMERS GUIDE

"The low of our cattle at sun-up minds us of our daily debt to Thee, our Father, that on this good land we do have life, liberty and the pursuit of happiness." -- Sam Guard in BREEDER'S GAZETTE

AEROSOLS PUT FARM WORK ON A PUSH-BUTTON BASIS

From animal spraying to implement painting, there are dozens of jobs around the farm that can be done a little easier and faster these days with an aerosol product.

Aerosols come in handy little pressurized cans that dispense a wide variety of liquids or semi-solids at the press of a button. For many small jobs, they can add minutes to the busy farmer's day by eliminating the time spent in mixing small amounts of materials best applied as a spray. Aerosols are clean, ready for instant use, and, because they are packed in sealed cans, their contents are protected from contamination in repeated use.

Take cattle spraying, for example. If only a few cows are to be sprayed for fly control, it may be impractical to mix up a small batch of chemicals. The aerosol packaged product provides a ready-mixed solution of the proper strength, ready to be dispensed quickly and efficiently. The pressure within the can is provided by a liquefied gas such as Du Pont "Freon" fluorinated hydrocarbon -- acting, in the aerosol package, pretty much like a built-in air compressor.

How It Works

Introduced into the can as a liquid, the propellent vaporizes as the active ingredients in the product are sprayed from the can. In most aerosol products, the liquefied gas propellent provides about 35 to 40 pounds pressure at 70° Fahrenheit and this steady, uniform pressure dispenses the contents of the can evenly and completely. Because higher temperatures create greater pressures, aerosol products should not be stored at temperatures over 125° Fahrenheit.

Cattle sprays in aerosol form, approved recently by the U. S. Department of Agriculture, contain pyrethrins, allethrin, Thanite and methoxychlor. A typical 12-ounce can will treat about 100 cows, spraying about a second on each side of the animal. These chemicals may be used on dairy cows without danger of contaminating the milk.

The same aerosols may be used also for space spraying in a barn or other enclosed building to control such pests as houseflies, horn flies, stable flies, and mosquitoes. In such cases, a five-second spray usually is sufficient to treat about 1,000 cubic feet. Spraying, of course, should be repeated every day or two.

Use the Right Spray

DDT and lindane are used as active ingredients in many of the insect control sprays. When aerosol sprays are used directly on animals, however, the active ingredients should be checked carefully. DDT and lindane, for example, should not be used on dairy cattle because these chemicals tend to find their way into the milk. Because these same chemicals may also accumulate in the fat and tissues of

beef cattle, sprays containing them should not be used on animals within 30 days of slaughter.

On the other hand, sprays containing either DDT or lindane are useful for treatment of hog pens, manure piles, chicken yards, and other areas where flies may breed.

The variety of animal sprays is almost as great as the number of insects that plague the farmer and his stock. Aerosol insecticides for control of flies and mosquitoes are fairly well-known, but newer ones with specialized uses are appearing almost daily.

Screw-worm Treatment

One of the more recent, for example, is a preparation for control of screw-worm. A two- or three-second spray drives the medicine down deep into pockets and crevices of the wound to get a quick kill of screw-worm larvae. A single 12-ounce can, the manufacturer claims, treats 180 to 270 wounds, protects the cattle against re-infestation for five to seven days, and marks the wound with a color dye that makes it easy to locate treated areas. It's especially recommended for use after castrating, dehorning, or docking, and on wire cuts and similar injuries to protect against screw-worm infestation.

Another aerosol product is useful in combating ear-ticks, with treatment of cattle suggested before they are turned out on brushy grazing areas. One of the self-spraying products recommended for use on horses not only repels bothersome flies but also is claimed to improve the animal's coat, making it glossy and easy to brush out.

For the poultry farmer, a vapor inhalant packed in the convenient, easy-to-use aerosol cans, helps relieve respiratory congestions in chickens caused by colds and bronchial infections. Sprayed in the poultry house according to directions, it aids in loosening accumulations of mucus in nostrils and throats.

Wide Range of Products

Although not economical for use on commercial acreages, a wide variety of insecticides are available in aerosol form to control insect pests in both vegetable gardens and flower beds.

Plant and animal sprays, however, are only a few of the aerosol applications useful on the farm.

There are waterproofers and preservative dressings for use on canvas and tarpaulins, rust preventives and lubricants for the care of farm implements and tools, and plastic protective sprays that provide a tough, moisture-resistant coating on many materials. There is even an aerosol ignition spray that gives spark plugs and other parts of the tractor or truck electrical system a protective coating that guards against dampness and short-circuits.

Especially useful and easy-to-apply are aerosol touch-up paints and enamels that quickly cover up scratches and prevent rust.

Another is an aerosol window cleaning solution that's simply sprayed on and then wiped off to leave a gleaming, dirt-free polish on the glass.

In the Farm Shop

Aerosol-dispensed lubricants and belt dressing compounds, according to their manufacturers, not only help provide smoother operation and longer life for belts and moving parts but contain anti-slip agents that cut down power loss due to belt slippage on pulleys.

And, at the end of the day, when the farmer is anxious to clean up, there's a pressure-packed waterless hand cleaner that not only whisks away dirt but contains lanolin to help soften the skin and prevent callouses.

This is only the beginning of a long list of aerosol products that have been perfected, or are being developed, for farm use. All of them have one thing in common -- convenience.

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NOTE: None of the aerosol products discussed in this story are manufactured by the Du Pont Company, although most of the products use Du Pont "Freon" fluorinated hydrocarbon as their propellent. Readers interested in any of the products may write AGRICULTURAL NEWS LETTER for manufacturers' names.

HOW BROILER RAISERS CAN GET MORE GAIN FROM LESS FEED!

A product which has resulted from more than 25 years of Du Pont research in poultry nutrition now offers broiler growers an opportunity to realize from $20 to $30 greater profit per 1,000 birds -- and even larger profit increases for turkey raisers.

The product is methionine -- proved to be the most critical of the 19 amino acids commonly occurring in feed proteins. Increased production facilities for methionine have now made it possible for feed manufacturers to supply methionine-fortified feeds wherever poultry is grown.

Feeding trials with methionine conducted in flocks throughout the country have been summarized in a new booklet, just off the press. Averaging the performance of more than 200 groups of chicks where comparisons were made, it was found that feeds to which methionine had been added produced approximately a three per cent improvement in weight, with an accompanying three per cent reduction in feed consumed per unit of gain. In addition, methionine produced marked improvements in feathering and higher grade dressed birds.

Readers wishing a copy of this new booklet on methionine may drop a post card request to AGRICULTURAL NEWS LETTER, Du Pont Company, Wilmington 98, Delaware.

CORN COBS AND OUR AMERICAN ECONOMY

This modern world of technology never ceases to amaze us.

Take the example of the corn cob!

Corn cobs, to the best of our recollection, used to be something the farmer was glad to give away, if he could. A certain amount he could use for bedding, if he had the right kind of animals. The rest was chucked out.

Then along came some people with test tubes. They found you could make a substance called furfural from the cob. The rest is an old story now. Du Pont chemists developed a way of making furfural into another compound, adiponitrile. A plant followed. Its production of adiponitrile now goes to other Du Pont plants where it is combined with other chemicals to make nylon. Eventually the cob becomes a part of a sheer nylon hose or filmy nightgown. A romantic ending to the old story where the cob ended up mostly as a pipe protruding from between Grandpa's teeth.

Now along comes the Encyclopedia Britannica Yearbook with an article on corn cobs. Seems about 600,000 tons of corn cobs were used in the U. S. last year. About two-thirds went into the production of furfural for various industrial applications. But other uses are being found, too: in the electroplating and metal stamping industries, as a mulch for the farmer, as poultry litter, and feed for cattle.

Somehow all this reminds us a bit of our grandmother who used to save all sorts of odd thread, string, and buttons. Brought up in the old school of thrift, she knew she'd have use for them someday. She usually did.

We've got all sorts of odd, unused material around this countryside of ours. Given time, like the thrifty grandmother, technology seems to find modern, up-to-date uses for these odd bits of scrap.

Look at the corn cob!

Technology, coupled with the freedom to investigate and inquire into potentially profitable opportunities -- it's one of the things that's put this nation of ours at the top of the heap today.

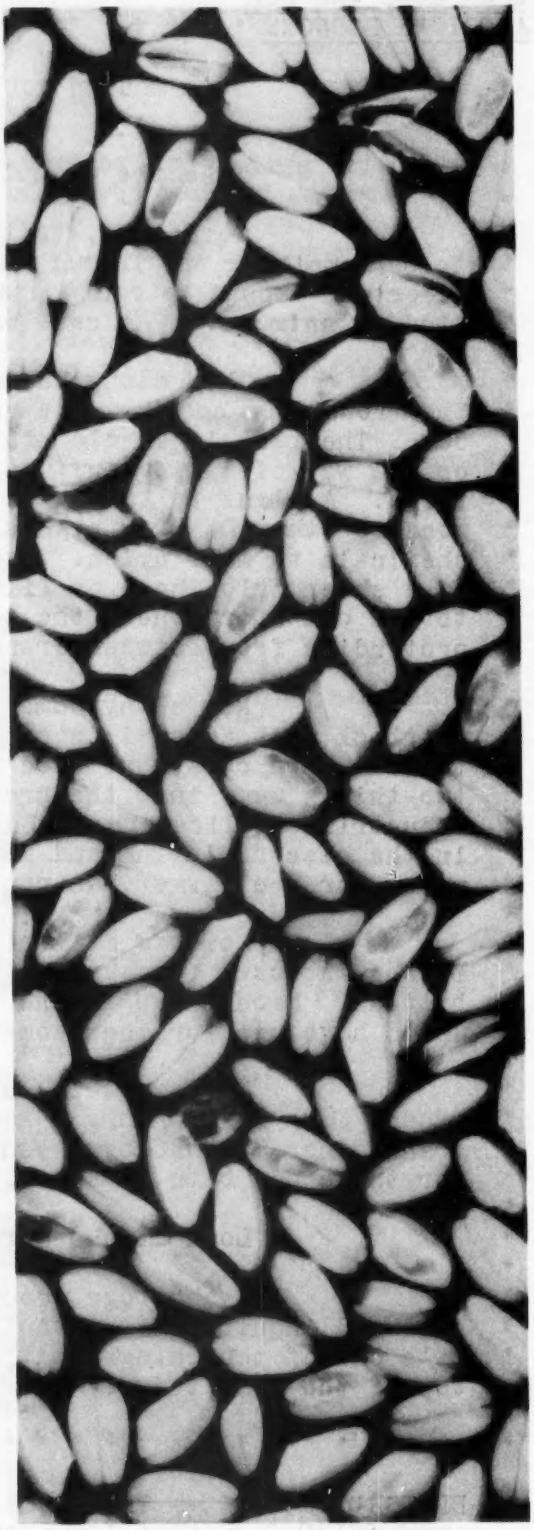
EDITOR'S CREDIT -- The above discourse on corn cobs and things appeared in a recent issue of "Elchem", publication at the Niagara Falls plant of Du Pont's Electrochemicals Department. The author was Jack Coad, editor of the paper.

PRESENCE OF INSECTS IN GRAIN SHOWN BY X-RAY EXAMINATIONS

Use of x-ray equipment to determine the extent of insect infestation in stored grain has been evaluated over the past three years. Already, a number of milling companies have installed equipment to make these examinations, and it seems likely that x-ray may come into common use in major grain storage areas throughout the country in the next few years.

Interest in this method of grain examination results from a program involving elevator operators, millers, government agencies, and others in the grain trade. Purpose of their cooperative efforts has been to improve the quality of grain going into products for human consumption.

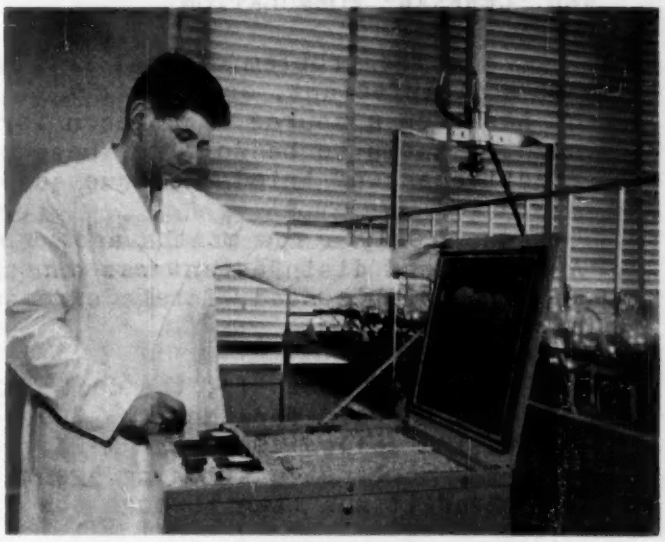
Heretofore, the most common method of testing grain for insect infestation has been to crack a sample of grain in a burr mill sufficiently to release insects inside the kernels, then to float the particles in mineral oil or gasoline so insects may be separated and counted. One man can perform from 25 to 50 such tests per day. The millers run these tests at the time of buying wheat, or when grain is changed from one bin to another to achieve even drying, or after fumigation. Samples are tested from every 1,000 bushels.



At right is a reproduction from an x-ray film, showing kernels with interior insect infestation. Note the dark marks, indicating presence of insect larva.

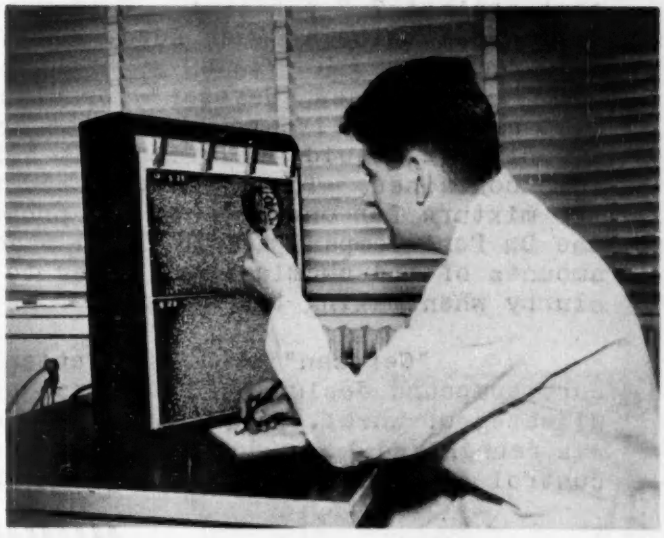
Started at Kansas State

About three years ago, two professors in the physics and chemistry departments respectively at Kansas State College initiated the idea of grain inspection via radiography (x-ray). Successful exposures have been made in times ranging from eight seconds to two minutes and 40 seconds, depending on exposure technique and the type of film used. Development of the film takes from five to eight minutes. Since a number of samples can be photographed on each film and all developed simultaneously, it is possible if required to run several hundred tests per day by this method. Very satisfactory results have been obtained using Du Pont's Type 506 fine-grain industrial x-ray film, as well as several other high-quality films available.



Grain samples spread out in preparation for x-ray exposure in the laboratory of a large milling company.

With the majority of grain insects, the life cycle from egg to mature larvae, ready to cut a hole in the grain case and emerge, runs from 18 to 22 days. In a well-defined x-ray film, the stages of development can be seen. Eggs are evident by the presence of egg channels. Larva from the pupa stage to the mature form ready for emergence also show up.



Reading the x-ray film to determine extent of insect infestation in grain samples.

X-ray films can also be used to check the effectiveness of grain fumigation. Since dead larvae shrivel after a period of several days, the radiographic examination can differentiate between dead and live larvae. It is also possible to determine the moisture content of grain through examining the density of the x-ray reproduction of the kernels.

DUST PROBLEM SOLVED WITH NEW "CERESAN" FORMULATION

The problem of dust irritation when seed is being treated with a disinfectant, or when treated seed is being handled or planted, has been a source of concern for some time. Now, the chemical industry seems to be solving these problems without sacrificing the effectiveness of tried-and-true seed-treating materials.

Only a few months ago, a new dustless formulation of "Arasan" seed disinfectant was announced -- "Arasan" SF-X -- for use on vegetable seed, forage crop seed, and seed of other important crops.

More recently, the dust problem has been solved in the old standby for grain treatment -- "Ceresan" seed disinfectant. A new formulation called "Ceresan" M-2X, especially designed for slurry treaters, combines a sticking agent to avoid "dusting-off" of the seed after it has been through the treating equipment.

Goes Twice as Far

"Ceresan" M-2X contains twice as much of the ethyl mercury active ingredient as the present "Ceresan" M formulation -- 15.4 per cent against 7.7 per cent. This means the same amount of material will treat twice as much seed.

The new "Ceresan" formulation comes in a convenient two-unit package -- five pounds of the seed disinfectant and the proper amount of a liquid sticking agent being in separate sections of the same container. To enable the seed treater to shift quickly from the mixture for one crop to the proper concentration for another, the Du Pont Company has prepared a conversion table, showing proper amounts of the chemical and water to add to various quantities of slurry when making the change.

"Ceresan" seed disinfectant was the first commercial mercury compound designed for control of seed-borne and soil-borne diseases of wheat, particularly the smuts. Later its effectiveness was recognized in producing better stands and heavier yields through control of diseases on other grain crops, flax, and cotton.

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"RUMEN INDUSTRIES, INC."

By Dr. M. F. Gribbins
Nitrogen Products Division
E. I. du Pont de Nemours & Co., Inc.

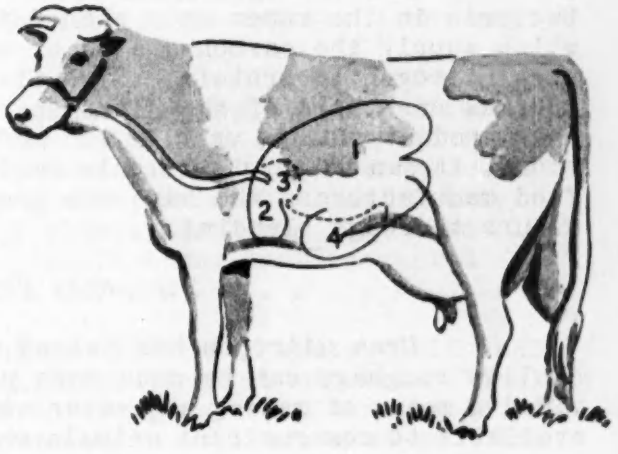
One of the oldest and largest of this country's chemical industries is "Rumen Industries, Inc." Engaged in the fermentation business, "Rumen Industries" practiced decentralization long before the threat of the atom bomb and has constantly followed a pattern of having many small installations. There are approximately 125,000,000 of these factories in the United States today. These are not large fermentation plants by the standards which are normally used in comparing manufacturing operations. The plants have an average daily capacity of about twenty gallons; they are mobile and self-propelled. We see them as cattle, sheep, and goats -- the ruminant animals.

While the term "ruminant" applies to all cud-chewing animals -- including buffalo, deer, giraffes, camels and others -- the remainder of this discussion deals only with the cow which may be considered as typical for all ruminants. The No. 1 stomach in the figure shown below is the rumen -- commonly known as the paunch -- and is the largest of the four stomachs of the cow.

Actually, the digestive process performed in this rumen is not accomplished by the cow herself but by billions of bacteria, yeasts, and other micro-organisms. Strictly speaking, these bacteria are tiny plants and their attack on the food supplied to them by the cow produces a breakdown of materials which is directly comparable to the action in a fermentation vat.

Break-down of Feeds

As fermentation is accomplished, feedstuffs are broken down into materials which the micro-organisms can assimilate, as well as into other materials which are digestible by the cow herself. After the micro-organisms have grown and completed their life cycle as a result of this process, they are passed along to the cow's other stomachs where they are, in turn, digested. We might say that there is a very rapid turnover in personnel among the numerous active employees of "Rumen Industries".



One of the "stockholders" in "Rumen Industries, Inc.", showing location of her rumen (1) and three other stomachs.

In effect, then, we see that the rumen might be thought of as a workshop in which billions of microscopic plants are able to break down the cellulose in the roughages eaten by the cow. In addition to furnishing food for the micro-organisms, this process provides organic acids (and perhaps simple sugars) which the cow is able to digest. At the same time the micro-organisms themselves serve as a source of protein.

The many plants of "Rumen Industries, Inc.", through their unique fermentation process, serve to convert otherwise indigestible roughage into usable materials. These materials, in turn, are converted into growth and into meat, milk, and hides -- essential end products for human consumption or use.

Increasing Rumen Efficiency

While the existence of the rumen has been known for centuries, it is only in recent years that its full significance in the production line of "Rumen Industries, Inc.", has been understood. As a result of these recent discoveries, animal nutritionists have been seeking ways to increase the effectiveness of the rumen as a source of simple carbohydrates and proteins, vitamins, and the many other chemical compounds which its inhabitants supply to the cow.

One important discovery was the fact that an increased supply of nitrogen made it possible for the microscopic plants in the rumen to make more effective use of the roughage supplied to them by the cow. Experiments conducted with synthetic urea in the form of "Two-Sixty-Two" feed compound, which contains 42 per cent nitrogen, disclosed that this product helped to stimulate rapid bacteria growth in the rumen, which, in turn, brought about more efficient cellulose breakdown. This means that cattle can now eat and digest roughages previously considered of little value.

The nitrogen from this feed compound can be utilized by the bacteria in the rumen only when fed along with grain or roughages which supply the carbohydrates or energy used in the conversion of urea nitrogen to protein. "Two-Sixty-Two" can be used to supply as much as one-third of the nitrogen requirements of the cow. So that this product will be used in its safest and most effective concentrations, it can be purchased only ready-mixed in feeds from reputable feed manufacturers who have the proper equipment and know-how to assure thorough blending.

Stretches Protein Supply

Urea nitrogen has helped to provide a way in which low quality roughage can be made more productive. Further, it has provided a means of making a greater amount of the other protein sources available to non-ruminant animals where urea nitrogen cannot be used.

For the past several years, experimentation has been going forward in all parts of the country to discover the best means of using "Two-Sixty-Two" to supplement such varied roughage materials as cotton seed hulls, palmetto leaves, needle grass, and desert shrubs

in the southern part of the country; and in other areas, corn cobs and stalks, wheat straw, and timothy hay.

While the nutrient composition of all of these may vary from one area to the next, "Two-Sixty-Two" used to increase their value has a uniform purity and concentration year in and year out. This fact offers definite advantages to the feed manufacturer in formulating high quality feeds which will serve the needs of the community in which he operates. Furthermore, the high concentration of urea nitrogen in this feed compound allows flexibility in formulating feeds by providing "room" for additonal minerals, readily available carbohydrates, and vitamins.

Like many a modern chemical plant, the production lines of "Rumen Industries, Inc.", are being checked for maximum efficiency in operation. The use of urea nitrogen provides a new raw material which contributes to more efficient -- and more economical -- production for the local installations with which cattle feeders and dairymen are so familiar.

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PEACH APHIDS & TOBACCO PLANTS

How does the green peach aphid injure tobacco plants? Experimenters have resorted to the use of radioactivity to learn that the aphid, a serious insect enemy of tobacco, actually prevents normal growth of the plant by injecting a poisonous substance.

Previous observations had familiarized entomologists with the aphid's feeding damage, and also with the fungus-developing properties of honey dew, deposited by the insect on tobacco leaves. As a result of these effects of aphid infestation, the lower, more valuable leaves of the tobacco plant may wither and drop off.

In recent experiments, aphids have been rendered radioactive, thus making the secretions which they inject into the plant also radioactive. Tests showed radioactivity around the punctures made by the aphids, and also traced the radioactive secretions to other parts of the plant, where they had been carried by movement within the plant's translocation system.

HOW MANY COTTON PLANTS PER ACRE? -- For the highest yields and best use of cotton picking machinery, there should be at least 20,000, and no more than 60,000 cotton plants per acre, according to findings of USDA experimenters in California tests. The larger number of plants per acre seemed to overcome the tendency of machine pickers to miss bolls growing close to the ground, since the lowest bolls in such fields were at greater-than-usual height from the ground. Yields decreased, however, when the plant population exceeded 60,000 per acre.

PROGRESS REPORT

Mesquite Spraying Produces 48 Per Cent
More Beef Per Acre in Texas Drought Years

Texas -- particularly the cattle country of West Texas -- has been beset by a series of drought years.

That's not news, particularly to Texans. But what is news is that on ranches where chemical sprays were used to kill thickets of mesquite and allow range grasses to thrive, cattle have gained 60 pounds more per head than on ranches where this pest went uncontrolled -- allowed to sap the soil of what little moisture was available.

This economic eye-opener showed up in a recent report on the eight-year research project in mesquite control carried on by the Texas Agricultural Experiment Station at Spur.

Over that eight years, the control of mesquite in experimental plots has been measured in terms of increased steer gains averaging 37 pounds per head per year, plus a marked improvement in the density of desirable range grasses. During one two-year period when rainfall was seven inches or more below normal, ranges where mesquite spraying had been practiced yielded 48 per cent more gain per acre. It was on these same ranges during the same two years, that steers averaged 60 pounds more gain per year than cattle on neighboring ranches where spraying was not carried on.

Dense mesquite growth has been for many years the most serious production problem on approximately 35 million acres of rangeland in the Southwest. Ranchmen have spent many millions of dollars trying to eliminate this thorny pest which hides cattle at round-up time, tears at horses and men, and robs ranges of the grass growth vital to beef production. Attempts at cutting, grubbing out, or individual poisoning of mesquite were too expensive, since there was a rapid reinfestation from sprout growth, seeds left in the soil, or seeds spread by grazing animals, coyotes, rabbits, and other wild life.

Then C. E. Fisher, superintendent and agronomist at the Spur station, began testing chemicals which could be sprayed on mesquite by plane. Five chemical companies, a flying service, the Flying Farmers' Foundation, and leading ranchers worked in close cooperation with him.

Results of those experiments were reported in AGRICULTURAL NEWS LETTER more than two years ago, when the first definite recommendations were made for use of low volatile esters of 2,4,5-T. The progress and observations in this work since that time have definitely established the sound economic value of the mesquite control program.

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HIDDEN ENEMIES THAT SAP CATTLE PROFITS

CAN BE CONTROLLED WITH PHENOTHIAZINE

By Dr. D. C. Boughton
Animal Industry Section
Du Pont Company

There is increasing evidence that light internal worm infections, which go unnoticed and have been considered of no economic importance, actually cost cattle raisers a substantial amount of money. Field tests conducted by Du Pont, various state college investigators, and others have shown that even with healthy animals on clean pasture, weight gains have been increased by as much as 50 per cent by controlling internal parasites.

As a result of these tests, the Du Pont Company is now recommending phenothiazine treatment for beef cattle on a year-round basis -- drenching at least twice a year plus continuous feeding of 1.5 to 2.0 grams of phenothiazine per day throughout the year, particularly when animals are on pasture or range. It has been found that cattle take phenothiazine readily in a loose mineral mix offered free-choice.

In Louisiana, a field test conducted during the summer on grade heifers averaging 438 pounds at the start demonstrated a significant growth advantage and consequent additional return from the use of phenothiazine. During the 167 days of the test, 10 treated grade Herefords gained an average of 186 pounds; 23 untreated controls gained only an average of 124 pounds during the same period. Based on costs and prices prevailing at the time of the test, the net return per head was $11.60 greater in the phenothiazine-treated group than in the controls.

Returns on Investment

One phenothiazine formulator found in a two-year test in Ohio on Hereford steers having only mild infections, the return in beef was 45 pounds for each pound of phenothiazine, or $4.46 for each dollar spent on the drug. The phenothiazine was administered free-choice in a mixture of one part phenothiazine to 10 parts salt. During the first year, the treated steers outgained the untreated by an average of 20.5 pounds per head; during the second year, a second treated group outgained their controls by 15.3 pounds per head. /1

In a ten-week test in Alabama, USDA investigators gave two-year-old purebred Hereford bulls (initial mean weight, 516 pounds) one treatment with phenothiazine. The treated group made an average gain of 49 pounds as compared with a gain of 46 pounds for a group of untreated controls with an initial mean weight of 650 pounds. /2

In a four-month field test conducted by Du Pont in the Gulf Coast area of Texas during the summer, drenching two-year-old steers with 62.5-gram doses of phenothiazine resulted in an average weight

13 pounds greater than that attained by a comparable control group. The treated herd returned $2.49 more per head than the untreated herd, after deducting the cost of the phenothiazine drench. This figure is based on the market price of beef at the time the field test was completed. All steers involved were in "good condition" prior to beginning the test. Their parasitic infections must have been relatively light, as judged by lack of symptoms and the small number of worm eggs revealed by fecal examinations.

Saving in Feed Bill

In a second Du Pont test in Texas, conducted this time during the wintering period, on recently weaned Hereford calves, phenothiazine resulted in a significant saving in the cost of supplement required to produce a pound of gain. The phenothiazine was incorporated in a cottonseed meal-salt mixture. During the 146 days on test, the treated group gained an average of 0.52 pounds per head per day and consumed an average of 0.43 pounds of cottonseed meal per day; their average daily intake of phenothiazine was 0.9 gram per day. The untreated calves gained 0.49 pounds per head per day and ate a daily average of 0.98 pounds of meal. During the test period, the treated calves gained an average of 75.6 pounds per head at an average cost of $2.81 for supplement feed, while untreated calves averaged 71.5 pounds gain per head at an average cost of $6.33 for meal supplement.

In another Texas field study, experiment station investigators found that phenothiazine given to unweaned beef calves on pasture reduces the parasite load and promotes growth. The calves, treated once with 60 grams of phenothiazine, made an average of 11 pounds more gain per head than comparable untreated calves, during a period of two months. /3

In a series of Oklahoma tests reported by workers at the Pawhuska field laboratory, beneficial results were obtained with phenothiazine low-level daily intake and also by a combination of therapeutic doses and daily low-level intake. /4

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/1 - Harwood, P. D. 1945. Phenothiazine in salt boosts cattle gains. Dr. Hess & Clark, Inc., Ashland, Ohio. Mimeographed.

/2 - Porter, D. A., Simms, B. T. and Cauthen, G. E. 1941. Field tests with phenothiazine as an anthelmintic in cattle. J. A. V. M. A. 99 (775): 272-278

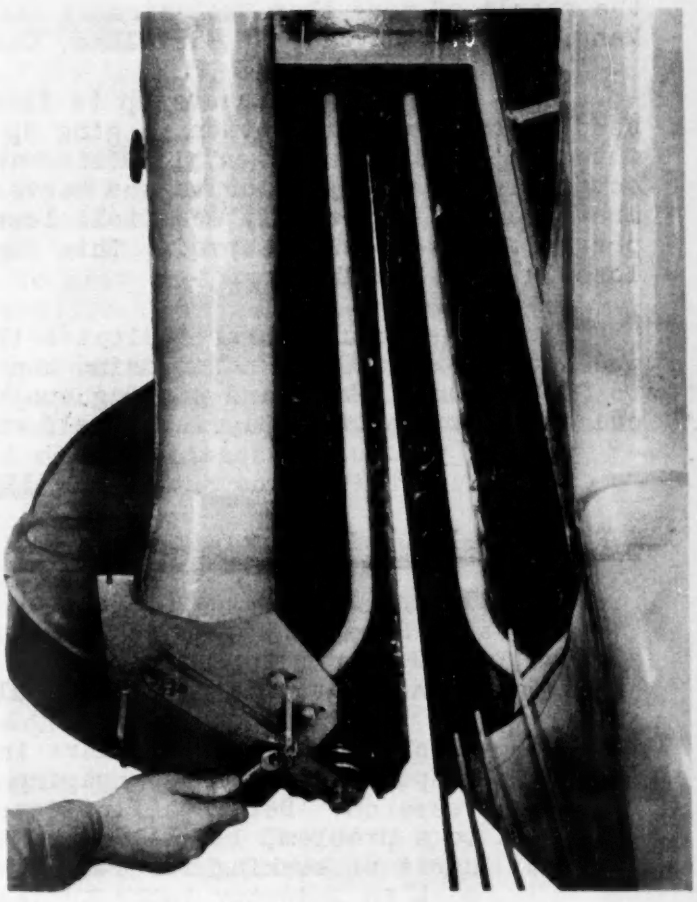
/3 - Simms, B. T., 1951. Treating unweaned beef calves with phenothiazine for internal parasites. Report, Chief, BAI for 1950: 54-55.

/4 - Brock, W. E., Pearson, C. C. and Kliewer, I. O. 1953. Daily minimal dosage of phenothiazine in control of nematode infections in cattle. Proceedings 89th Annual Meeting (1952) Am. Vet. Med. Assoc.; 167-171.

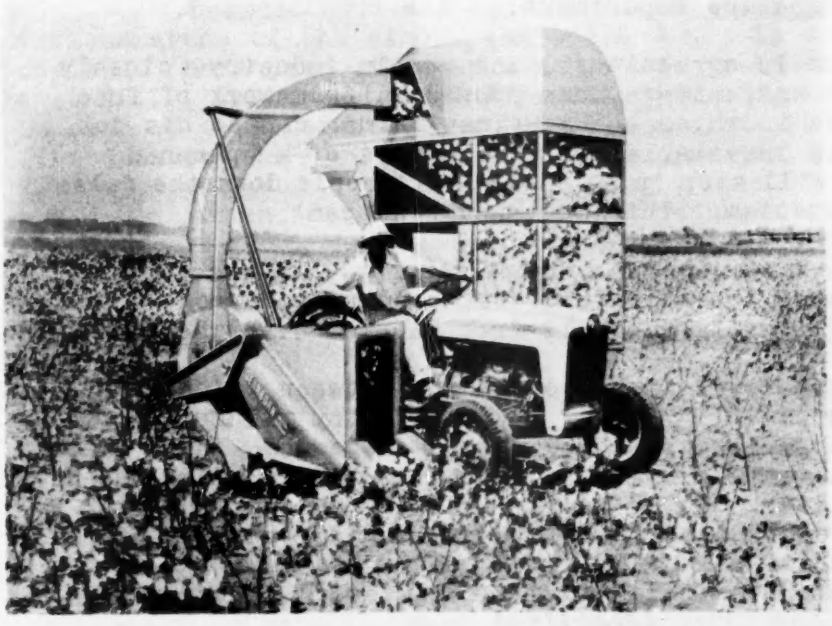
NEW COTTON PICKER USES NYLON BRUSHES

A new low-cost cotton picker designed to bring mechanical harvesting within the reach of thousands of cotton growers who now pick by hand has been announced by the Ford Tractor Division of the Ford Motor Company.

The simply designed mechanism makes use of rotating brushes bristled with Du Pont nylon to remove the cotton from the bolls. The locks of cotton are then drawn to a by-pass fan and delivered to a trailing wagon or special cotton basket mounted on the tractor. The nylon bristled brushes developed especially for this application are



Ease of adjustment is a feature of the brushes bristled with Du Pont nylon which are used in the new low-cost Dearborn cotton picker.



The new lou-cost Dearborn cotton picker in operation. Brushes bristled with Du Pont nylon are mounted within the opening by the driver's right knee.

the result of more than two years of intensive research by the Osborn Manufacturing Company of Cleveland, Ohio.

The machine covers up to 1¼ acres per hour and has been used successfully in cotton ranging up to 4½ feet in height. It is intended for use only when all bolls have opened. Defoliation of the cotton is necessary prior to the harvesting. When these conditions are observed, remarkably low field losses, ranging from one to two per cent, have been observed. This figure is about equal to the loss in hand picking.

The manufacturer indicates that, at current cotton prices and picking costs, the new machine can save cotton growers from $25 to $45 per bale over hand picking costs, which means that the mechanical picker could pay for itself on 30 to 50 bales.

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MR. SECRETARY SAYS - -

The following is an excerpt from an address by Secretary of Agriculture Ezra Taft Benson before the recent National Institute of Animal Agriculture:

> "I should like to see more industries shoulder their responsibilities by engaging in aggressive programs of research. Before asking Government to find an answer to a problem, I should like to see industry develop the habit of seeking its own answer...It can be done through work in industry laboratories, through contracts with private research institutes, grants to universities, and through cooperative financing with state experiment stations and the Department.
>
> "Unless we in agriculture, and you in industry, closely allied to agriculture, can provide a framework of free enterprise in which the American farmer can do his job, then it is inevitable that the forces of a 'planned economy' will step in to entice our people down the false road of statism. This must never happen!
>
> "Research has made our country strong...The research of today shapes the welfare of our country tomorrow -- and indeed, the welfare of all free peoples everywhere.
>
> "Already there is much cooperation between industry and agriculture. In 10 years' time, industry and agriculture, working together, put hybrid corn on farms. In 10 years, working together, industry and agriculture doubled the use of fertilizer. In 15 years, industry and agriculture, working together, largely accomplished the miracle of farm power mechanization...I challenge you to make the record of the future twice as good as the record of the past."

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COTTON GROWING CONTEST

Results from Five-Acre Plots Point Way to More Bales from Mississippi

Contests seem of little value unless they prove something. In Mississippi, cotton growers in all sections of the state have been competing in a five-acre cotton contest for the past five years, and the records they have made seem to prove definitely that there is a "right way" and a "wrong way" to grow the crop, if you want to end the year with a profitable operation.

During the growing season of 1947, cotton specialists at Mississippi State College analyzed all the research data they could lay hands on relating to recommended modern practices for improving cotton production. They found ready listeners when they showed the results of their studies to leaders in the cotton industry.

In November of that year, a committee of 42 men was formed. They represented cotton breeders, farmers, ginners, buyers, warehousemen, cottonseed crushers, farm equipment dealers, insecticide and weed killer companies, and other related industries and interested educational agencies. It was this group which set up the rules and offered the prizes in what is now known as the Mississippi Five-Acre Cotton Improvement Contest.

Complete Records

Each contestant enters a measured five-acre plot, on which accurate records are kept on the amount of fertilizer applied, date of planting, percentage of stand achieved, cost of weed control, dusting or spraying against insects, and the final yield of lint.

Because soil and climatic conditions are different in various areas of the state, the prize money is divided among three regions. Last year, the top six growers in each district -- Northeast Hills, Delta, and South Mississippi -- split $1,000. Top grower in each of these areas won a "State Award" of $500, while the next five drew prizes from $150 to $50.

As an idea of the sort of cotton growing it takes to win at this game, here are some brief facts about the three state award winners last year:

Northeast Hills Champ

Harris Swayze of Midway community, Yazoo county, won the Northeast Hills District award. He had a loam soil field in a creek bottom, high in organic matter and with a pH of 6.2, which indicated a need for lime. Potash and phosphorus were also needed.

He did not grow a winter cover crop, but during the winter and spring months he applied five tons of lime, 10 tons of barnyard manure, two tons of 6-8-8, a ton of superphosphate, and 1,000 pounds of muriate of potash. Mechanically delinted and chemically treated

seed was planted on May 12. In June, 150 pounds of nitrogen were applied as a side-dressing. His total bill for fertilizer and its application ran $62 per acre. During the growing season, he irrigated the crop twice by sprinkler irrigation system.

Between the time cotton emerged and the end of May, two insecticide applications were made to control thrips, cutworms, and early boll weevils. In June, three more sprays were applied against boll weevil and worms. In July, four sprays were applied by plane, and in August and September five more air-borne applications of 3-5-40 and 3-10-40 were made, last poison being put on September 3. The complete poisoning program cost $21.90 per acre, and increased the yield by 900 pounds of seed cotton per acre.

The pay-off -- 8,890 pounds of lint from the five acres.

Delta Winner

In the Delta District, high man was Harris Barnes, Jr., of Sherard. For years the land he planted had been used for hogging-off corn and soybeans. It was its second year in cotton. Prior to planting it to good, treated seed on May 13, he turned under a good winter crop of hairy vetch and applied enough of a commercial nitrogen compound to provide 80 pounds actual nitrogen per acre. Later, 40 pounds of nitrogen was used as a side-dressing.

A pre-emergence application of one of the new chemical weed killers was made and the cotton made a 95 per cent perfect stand. Later, the same chemical was applied as a post-emergence treatment. These two treatments kept grass and weeds down to the point where only one hand-hoeing was necessary to cut out vines.

Poisoning for pest control started May 22 and a total of 17 applications were made between then and September 15. Cost was $35.80 per acre for these insecticide treatments and as a result of this complete poisoning program the total yield was increased by 1,000 pounds of seed cotton per acre.

Mr. Barnes produced 7,041 pounds of lint on the five acres.

South Mississippi

In the southern district, J. F. Jones of Smithdale was the champion. He planted April 20 on bottom loam soil which had been in lespedeza the preceding year. In preparation for the crop, on April 1 he applied 500 pounds of muriate of potash and 5,000 pounds of basic slag. At the time of planting, 2,500 pounds of mixed fertilizer was worked deep into the seedbed. On June 10 and again on July 15, he applied 750 pounds of nitrogen as a side-dressing. Total cost of fertilizer was $38.50 per acre.

From May 5 through August 15, a total of 10 dustings were applied to control pests. The material used in all cases was 3-5-0, applied with a tractor-mounted duster. The cost for the entire poisoning program ran just $11.00 per acre.

Mr. Jones' yield was 6,300 pounds of lint from the five acres.

Yields Supply Proof

In 1951, a comparatively dry year, a study was made of the relationship of the number of insecticide applications to cover yield on all the five-acre contest plots in the state. Here's the way it averaged out:

Insecticide Applications - None	1-3	4-6	6-8	8-10	10 & Over
Pounds of Lint Per Acre -- 330	658	788	851	966	1,138

An even more interesting picture of the way both insect control and fertilization affect yields is seen in a study of the contest plots in the Delta District for the same year. Here are the averages from data collected:

Date Planted	No. Times Poisoned	Av. Lbs. Fertilizer Used			Av. Lbs. Lint Per Acre
		Nitrogen	Phos.	Potash	
April 26	None	74	32	32	553
April 18	4-6	59	40	20	953
April 18-28	6-8	41	29	17	1,061
April 20-29	8-10	81	0	0	1,105
April 18-26	10 and over	90	52	42	1,441

The results from these five-acre contests leave little doubt that the approved practices pay off well when the bales are counted. The pile of data on this score, which the contest records have provided, is pretty well summarized by T. M. Waller, associate extension agronomist in cotton, who points out:

"In every instance, yields were increased from twice to three times per acre, as compared to a haphazard production program!"

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* MACHINE GRADES EGGS FOR SHELL COLOR -- New Yorkers will pay a premium for white-shelled eggs. In Boston, housewives prefer them brown. Now engineers of the USDA have developed an experimental machine to automatically sort eggs according to shell color.

EXPERIMENTERS' NOTATIONS

A Round-up of Data from Across the Nation

Effective control of mature plants and sprout regrowth of Lindheimer prickly pear cactus has been obtained with 2,4,5-T ester at 0.6 and 1.0 per cent acid in oil, or oil-water sprays, report agronomists of Texas A. & M. College. A proper spray solution can be prepared by mixing low-volatile esters of 2,4,5-T containing four pounds acid equivalent per gallon at the rate of a gallon of the chemical to 50 gallons of diesel fuel or kerosene. This cactus is a common pest on most of the rangeland of South Texas and other sections of the Southwest.

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After a three-year study on the possible effect of certain spray materials on the quality of canned and frozen Montmorency cherries, Michigan State College experimenters report that ferbam, nabam, copper, copper and one oil wax emulsion, and nabam and one oil wax emulsion, produced no significant difference in the quality of processed cherries. Ferbam and nabam are the active ingredients in "Fermate" fungicide and "Parzate" liquid fungicide, respectively.

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Dipping fresh-killed poultry in chlorine-treated water has been found to extend the freshness of the meat, according to experiments conducted by Dr. M. Wayne of the Washington Co-operative Farmers Association in Seattle. Stored two weeks at a temperature of 33 degrees F., the treated birds showed only about one-tenth the bacteria count of untreated birds stored under similar conditions.

#####

In early summer, when it becomes necessary to protect blueberries against cherry and cranberry fruitworms, and the berry plant against sharpnosed leafhopper, a first dusting should be applied using five per cent methoxychlor, says Dr. Ordway Starnes, extension entomologist at Rutgers University. A week later, a dusting with one per cent parathion should be put on. If the pests are still present the third week, use five per cent malathion to protect late berries.

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Yield increases of summer squash ranging from 60 to 142 bushels per acre are reported by the Agricultural Experiment Station of North Carolina State College as a result of spraying with zineb or nabam to control squash scab. Among the tested materials, "Parzate" fungicide reduced the percentage of fruit infected by scab to one-half of one per cent, while untreated sections of the field averaged 47.5 per cent scab infestation.

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